code lock

032

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The combination of a couple of thyristors, key switches and a relay as shown in the diagram forms a suitable, reasonably tamper-proof code lock for use in, say, a car. To open the lock,a number of keys must be pressed in a prescribed sequence to energize a relay, whereupon the battery voltage is applied to the ignition switch.

The first key to be pressed is S_4, whereupon capacitor C_1 is charged via resistor R_1. The charge on this capacitor ensures that transistor T_1 is on for about 15 seconds, during which relay Re_1 is energized. However, within these 15 seconds, key S_5 must be pressed to switch on thyristor THR_1. Then S_6 must be pressed to switch on THR_2. Finally, S_7 is to be pressed to switch on THR_3. When that is done, relay Re_2 is energized, and the lock is open.

If within the initial 15 seconds the wrong key is pressed, C_1 is discharged, whereupon T_1 is cut off and Re_1 is deactuated. When this happens, D_2 lights briefly. The lock can then be opened only by starting with pressing S_4 again. This applies also if S_5 is not pressed within the initial 15 seconds.

The lock is provided with a rapid access facility. In the actuated state, capacitor C_3 is charged via THR_3. When the ignition is switched off for only a brief period (for instance, when the driver stops to post a letter [sic]), the capacitor is discharged only slowly, so that THR_3 may be switched on again by pressing S_8. Since this makes the lock less secure, the rapid access facility may be disabled by pressing S_9. Capacitor C_3 is then discharged rapidly and D_4 lights briefly.

The circuit draws a quiescent current of about 12 mA, which rises to some 80 mA when both relays are actuated.

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